Thank you for choosing a Nu-way burner. As you would expect from a Company who has a pedigree of more than 75 years in the heating industry, our after sales service is second to none.

Your relationship with Nu-way does not stop with the purchase of a burner. We have a team of highly experienced Service Engineers who travel throughout the UK and around the world, to service and react swiftly to breakdowns. Preventative maintenance is clearly the most cost effective way of ensuring that the burner is running at its most efficient, but also that business critical activities are not interrupted with potentially costly breakdowns. A Nu-way Service contract is a cost effective way of ensuring the correct and most efficient output and reliability from your Nu-way burner is maintained at all times.

Nu-way Spares Department carry more than four thousand spares, all of which are available from stock at competitive prices. Nu-way has the largest range of commercial spares available to the market. Our Spares sales team collectively have more than 170 years employment with Nu-way and are therefore more than experienced in offering advice and practical backup, by ensuring the correct part is identified and despatched in a timely manner.

In addition to these departments we also offer a dedicated technical helpline which is manned during office hours. (Please note this is a premium rate line)

The Nu-way promise is that your investment in a Nu-way burner is fully supported throughout the life of the product.

Please call us to discuss how we can ensure you benefit from the many services we have to offer.

Burner Sales: 01905 791640
Service: 01905 791680
Spares: 01905 791650
Technical Helpline:
COMPONENTS
1. Reset button
2. Control box
3. Ignition transformer
4. Ignition cables
5. Nozzle assembly
6. Nozzle
7. Brake plate
8. Blast tube
9. Ignition electrodes
10. Connecting pipe
11. Air damper
12. Solenoid valve
13. Pump
14. Drive coupling
15. Indication, air damper
16. Fan wheel
17. Adjustment, air damper
18. Photoresistor
19. Motor
TECHNICAL DATA
ST 40 PL 6-7-19-10

DIMENSIONS

<table>
<thead>
<tr>
<th>Burner tube</th>
<th>Length of burner tube</th>
<th>Incl. flange A Measure B</th>
<th>Incl. flange B Measure B</th>
<th>Incl. flange C Measure B</th>
<th>Incl. flange D Measure B</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL 6-7-19-10</td>
<td>80</td>
<td>45</td>
<td>58</td>
<td>66</td>
<td>65</td>
</tr>
<tr>
<td>PL</td>
<td>127</td>
<td>92</td>
<td>105</td>
<td>113</td>
<td>112</td>
</tr>
</tbody>
</table>

MOUNTING DETAILS
Drill & Tap 2 x M9 holes on the horizontal centre line or 4 x M9 holes at 45 degrees

OUTPUT RANGE AND NOZZLES RECOMMENDED

<table>
<thead>
<tr>
<th>Oil capacity (kg/hr)</th>
<th>Output (kW)</th>
<th>Btu/hr.</th>
<th>Recommended nozzle Angle</th>
<th>Type</th>
<th>Recommended pump pressure Bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 - 3.3</td>
<td>17.8 - 39.0</td>
<td>133,500</td>
<td>80°</td>
<td>H, S</td>
<td>10</td>
</tr>
</tbody>
</table>

The net calorific value of 11.86 kWh/kg for light oil has been used.

RECOMMENDED NOZZLE
Because of different boiler types existing on the market, with varying combustion chamber designs, it is not possible to state a definite spray angle or spray pattern. Note that the spray angle and the spray pattern change with the pump pressure.

BURNER HEAD

mbar

kg/h

kw
TECHNICAL DATA
DIMENSIONS

Flange A

Flange B

Flange C

Flange D
GENERAL RULES
The installation of an oil burner should be carried out in accordance with local regulations. The installer of the burner must therefore be aware of all regulations relating to oil and combustion.

Only oil suitable for the burner should be used and then in combination with a suitable oil filter before the oil pump of the burner.

If the burner is replacing an existing burner make sure that the oil filter is replaced or cleaned. The installation must only be undertaken by experienced personnel.

INSTALLATION INSTRUCTIONS
General installation instructions accompany the burner and should be left in a prominent place adjacent to the burner.

ADJUSTMENT OF BURNER
The burner is from the factory pre-set to an average value that must then be adjusted to the boiler in question.

All burner adjustments must be made in accordance with boiler manufacturers instructions. These must include the checking of flue gas temperatures, average water temperature and CO₂ or O₂ concentration.

To adjust the combustion device, start by increasing the air volume somewhat. When the burner starts it is burning with excess air and smoke number 0. Reduce the air volume until soot occurs and increase again to reach a combustion free of soot.

By this procedure an optimum adjustment is obtained. If larger nozzles are used the preadjustment of the air volume must be increased.

CONDENSATION IN CHIMNEY
A modern burner works with less excess air and often also with smaller nozzles than older models. This increases the efficiency but also the risk of condensation in the chimney. The risk increases if the area of the chimney flue is too large. The temperature of the flue gases should exceed 60°C measured 0.5 metres from the chimney top.

Measures to raise the temperature:
- Insulate the chimney in cold attics
- Install a chimney liner
- Install a draught regulator (dilutes the flue gases during operation and dries them up during standstill)

AIR ADJUSTMENT

INSTRUCTIONS FOR USE
The end user should be instructed about the operation and safety features of the burner.

He should also be made aware of the importance of the area around the boiler/burner being kept free of combustible material.

PUMP ADJUSTMENT
See separate description.

ADJUSTMENT OF BURNER
To obtain a correct adjustment a flue gas analysis and a temperature measurement must be carried out. Otherwise there is a risk that a bad adjustment may cause a formation of soot, bad efficiency or condensate in the chimney.

MAINTENANCE
The boiler/burner should be examined regularly for any signs of malfunction or oil leakage.
Warning: Before doing any service switch off power at the main switch and cut off the oil supply.

SERVICE OF BURNER HEAD AND NOZZLE ASSEMBLY
ELECTRIC EQUIPMENT
OIL BURNER CONTROL: SATRONIC TF 830B/TF 830B.2B/TF 832.3

FUNCTION
1. Switch on operating switch and twin thermostat
   The burner motor starts, an ignition spark is formed, the prepurge goes on till the prepurge period expires and the solenoid valve opens (2).

2. Solenoid valve opens
   Oil mist is formed and ignited. The photocell indicates a flame.

3. The safety time expires
   a. If no flame is established before this time limit the control cuts out
   b. If for some reasons the flame disappears after this time limit, the burner will make an attempt to re-start

4. Ignition spark goes out
   The ignition spark goes out 20 s. after flame indication and the burner is in operating position.

4-5. Operating position
   If the burner operation is interrupted by means of the main switch or the thermostat, a new start takes place when the conditions in accordance with point 1 are fulfilled.

   The oil burner control cuts out
   A red lamp in the control is lit. Press the reset button and the burner re-starts.

LIST OF COMPONENTS
A1 Oil Burner control  P1 Time meter (optional)
A2 Twin thermostat    R1 Photocell
F1 Fuse, max 10A      S1 Spare terminal
H1 Alarm lamp         S3 Main switch
H2 Signal lamp (optional)  T1 Ignition transformer
M1 Burner motor      Y1 Solenoid valve

Mains connection and fuses in accordance with local regulations

TECHNICAL DATA
Pre-ignition time: 12 s
Pre-purge time: 12 s
Safety lock-out time: 10 s
Post-ignition time: 20 s
Reset time after lockout: min. 60 s
Reaction time on flame failure: max. 1 s
Ambient temperature: from -0 to +60°C
Min. current with flame established: 24 µA
Enclosure: IP 44
(Under voltage proof only TF 830B.2B)

CONTROLL OF PHOTO CURRENT
Current through photo unit is measured with a d.c ammeter (a moving coil instrument connected in series with the photo unit).
INSTRUCTIONS PUMP TYPE DANFOSS BFP11

TECHNICAL DATA
Viscosity range: 1,3-12,0 mm²/s
Pressure range: 7-15 bar
Oil temperature: -10 to +70°C

COMPONENTS
1. Nozzle port R 1/8''
2. Pressure gauge port
3. Pressure adjustment, 4mm allen key
4. Vacuum gauge port R 1/8''
5. Return line R 1/4''
6. Suction line R 1/4''
7. Suction line R 1/4''
8. Return plug

SUCTION LINE TABLES
The suction line tables consist of theoretically calculated values where the pipe dimensions and oil velocity have been matched so that turbulences will not occur. Such turbulences will result in increased pressure losses and in acoustic noise in the pipe system. In addition to drawn copper piping a pipe system usually comprises 4 elbows, a non-return valve, a cut-off valve and an external oil filter.

The sum of these individual resistances is so insignificant that they can be disregarded. The tables do not include any lengths exceeding 100 m as experience shows that longer lengths are not needed.

The tables apply to a standard fuel oil of normal commercial quality according to current standards. On commissioning with an empty tube system the oil pump should not be run without oil for more than 5 min. (a condition is that the pump is being lubricated during operation).

The tables state the total suction line length in metres at a nozzle capacity of 2,5 kg/h. Max. permissible pressure at the suction and pressure side is 2,0 bar.

PURGING
On 1-pipe systems it is necessary to purge the pump. On 2-pipe systems purging is automatic through the return line.
FUNCTION DANFOSS BFP11

When the oil pump is started, oil is drawn from the suction connection (S) through the filter (H) to the suction side of the gear wheel (C).

The gear wheel then pumps oil to the pressure side and the oil is put under pressure.

The pressure is controlled and kept constant at the set value by the regulating valve (P1) with the diaphragm (D).

The regulating valve (P1) distributes the oil quantity supplied by the gear set (C) between the nozzle port (E) and the return side of the pump (R).

The oil quantity utilized is determined by the set pressure on the regulating valve (P1) and the size of the oil nozzle in the nozzle line.

The valve (P1) functions in the following way:
- When the opening pressure has been reached, the passage to the return side opens.

- The diaphragm and the spring keep the pump pressure constant at set value.
- If the pump is overloaded, i.e. if you try to get out more oil than the gear set can supply under existing circumstances, the oil pressure falls below the set value and the valve closes against the return side (R) by means of the diaphragm (D) and goes into starting position.

This can be remedied by:
- Reducing the pump pressure.
- Reducing the oil quantity supplied by using a smaller nozzle.
- Using a pump with a larger capacity.

In case of one-pipe operation the horse-shoe-shaped washer will be mounted under the screw head, and in case of two-pipe operation, the horse-shoe-shaped washer will be removed.

The horse-shoe-shaped washer will be introduced in all BFP 11-pumps.

To minimize the leak between cover plate and pump housing when running one-pipe operation, the changeover screw will be mounted generally. But in order for the return oil in the pump to be able to flow freely to the suction side, a horse-shoe-shaped washer will be mounted under the screw.

REPLACEMENT OF CARTRIDGE FILTER, MOUNTING/DISMOUNTING RETURN PLUG
The table applies to oil with a viscosity of 4.4 mm²/s (cSt) with density 830 kg/m³.

**BURNER WITH PREHEATER**
Consider that on preheating the oil quantity is reduced by 5-20% depending on - Rise in temperature at the nozzle - Design of nozzle - Capacity (high capacity - small difference)
**FAULT LOCATION**

**BURNER FAILS TO START**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Possible causes</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor runs</td>
<td>Flame instability</td>
<td>Check nozzle to burner head dimension and electrode position</td>
</tr>
<tr>
<td>Burner pre-purges</td>
<td>Incorrect head settings</td>
<td>Check oil pressure</td>
</tr>
<tr>
<td>Flame occurs</td>
<td>Low oil pressure</td>
<td>Adjust air damper</td>
</tr>
<tr>
<td>Burner locks out</td>
<td>Excess air</td>
<td>Check that photocell is clean and unobstructed</td>
</tr>
<tr>
<td>Motor runs</td>
<td>Photo-cell not seeing light</td>
<td>Confirm with new photocell</td>
</tr>
<tr>
<td>Burner pre-purges</td>
<td>Control faulty</td>
<td>Confirm with new control. (NB. it is advisable to change the photocell if also changing control)</td>
</tr>
<tr>
<td>No flame occurs</td>
<td>False light</td>
<td>Check that photo-cell is not seeing ambient light</td>
</tr>
<tr>
<td>Burner locks out</td>
<td>No spark</td>
<td>Check that H.T. leads are sound and are not arcing other than at electrode gap</td>
</tr>
<tr>
<td></td>
<td>No oil</td>
<td>Check oil supply to burner - check that pump is not airlocked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check operation of magnetic valve</td>
</tr>
</tbody>
</table>

**BURNER FAILS TO START AFTER NORMAL OPERATION**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Possible causes</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burner fails to start</td>
<td>Fuse has blown</td>
<td>Check or replace fuse if necessary. Check reason for failure</td>
</tr>
<tr>
<td>Lamp not lit</td>
<td>Appliance thermostat has not reset</td>
<td>Adjust thermostat</td>
</tr>
<tr>
<td></td>
<td>Appliance overheat device has operated</td>
<td>Reset overheat device. Find reason for its operation and rectify</td>
</tr>
<tr>
<td></td>
<td>Control relay or photocell defective</td>
<td>Check by replacement</td>
</tr>
<tr>
<td>Motor runs</td>
<td>No oil being delivered</td>
<td>Check that tank, oil lines, fire valve, pump and nozzle are all in good order</td>
</tr>
<tr>
<td>Burner runs to lockout</td>
<td>Excessive flue draught is preventing flame establishment</td>
<td>Rectify condition</td>
</tr>
<tr>
<td></td>
<td>No spark</td>
<td>Check ignition transformer. Check electrode gap and porcelains</td>
</tr>
</tbody>
</table>

**DELAYED IGNITION, BURNERS STARTS VIOLENTLY**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Possible causes</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burner pulsates on start-up only with hot flue</td>
<td>Excessive draught</td>
<td>Recommission burner</td>
</tr>
<tr>
<td>Burner pulsates on start-up</td>
<td>Nozzle partly blocked</td>
<td>Replace nozzle</td>
</tr>
<tr>
<td></td>
<td>Oil pressure too low</td>
<td>Check and recommission</td>
</tr>
<tr>
<td></td>
<td>Flue blocked or damaged</td>
<td>Check and rectify</td>
</tr>
<tr>
<td></td>
<td>Fan slipping on shaft</td>
<td>Check and retighten</td>
</tr>
<tr>
<td></td>
<td>Pump coupling loose or worn</td>
<td>Check and replace</td>
</tr>
<tr>
<td>Burner starts violently</td>
<td>Delayed ignition</td>
<td>Check the electrode adjustment, see diagram</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check electrodes for damage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check H.T. leads for damage and disconnection</td>
</tr>
</tbody>
</table>
NOTES